

Constrained Motion Control Using Vector Potential Fields

Masoud, Samer A. and Masoud, Ahmad A. (2000) .

Constrained Motion Control Using Vector Potential Fields. The IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans, 30 (3). pp. 251-272.

Abstract

Discusses the generation of a control signal that would instruct the actuators of a robotics manipulator to drive motion along a safe and well-behaved path to a desired target. The proposed concept of navigation control along with the tools necessary for its construction achieve this goal. The most significant tool is the artificial vector potential field which shows a better ability to steer motion than does a scalar potential field. The synthesis procedure emphasizes flexibility so that the effort needed to modify the control is commensurate with the change in the geometry of the workspace. Theoretical development along with simulation results are provided